

WHAT IS CLAIMED IS:

1. A method of producing a genetically modified plant having increased size as compared to a wild-type plant, comprising:

contacting a plant cell with at least one nucleic acid sequence encoding a DAS5 protein, said nucleic acid sequence operably associated with a promoter, to obtain a transformed plant cell;

producing a plant from said transformed plant cell; and

selecting a plant exhibiting said increased size.

2. The method of Claim 1, wherein the contacting is by physical means.

3. The method of Claim 1, wherein the contacting is by chemical means.

4. The method of Claim 1, wherein the plant cell is selected from the group consisting of protoplasts, gamete producing cells, and cells which regenerate into whole plants.

5. The method of Claim 1, wherein the promoter is selected from the group consisting of a constitutive promoter and an inducible promoter.

6. The method of Claim 1, wherein said DAS5 protein has the amino acid sequence of SEQ ID NO: 1.

7. The method of Claim 1, wherein said nucleic acid sequence has the sequence of SEQ ID NO: 3.

8. A genetically modified plant exhibiting increased size in comparison to a wildtype plant, wherein said genetically modified plant comprises at least one exogenous nucleic acid sequence encoding a DAS5 polypeptide, wherein said polypeptide comprises an amino acid sequence with at least 80% sequence homology to SEQ ID NO : 1.

9. The genetically modified plant of Claim 8, wherein the amino acid comprises at least 85% homology to SEQ ID NO:1.

10. The genetically modified plant of Claim 8, wherein the amino acid comprises at least 90% homology to SEQ ID NO:1.

11. The genetically modified plant of Claim 8, wherein the amino acid comprises at least 95% homology to SEQ ID NO:1.

12. The genetically modified plant of Claim 8, wherein the exogenous nucleic acid sequence is linked to a promoter selected from the group consisting of: a constitutive promoter and an inducible promoter.

13. The genetically modified plant of Claim 8, wherein said amino acid has the amino acid sequence of SEQ ID NO: 1.

14. The genetically modified plant of Claim 8, wherein said exogenous nucleic acid sequence has the sequence of SEQ ID NO: 3.

15. The genetically modified plant of Claim 8, wherein the plant is a dicotyledonous plant.

16. The genetically modified plant of Claim 8, wherein the plant is a monocotyledonous plant.

17. A genetically modified seed, wherein said seed produces a plant exhibiting increased size in comparison to a wildtype plant, wherein said genetically modified seed comprises at least one exogenous nucleic acid sequence encoding a DAS5 polypeptide, wherein said polypeptide comprises an amino acid sequence with at least 80% sequence homology to SEQ ID NO: 1.

18. The genetically modified seed of Claim 17, wherein the amino acid comprises at least 85% homology to SEQ ID NO: 1.

19. The genetically modified seed of Claim 17, wherein the amino acid comprises at least 90% homology to SEQ ID NO: 1.

20. The genetically modified seed of Claim 17, wherein the amino acid comprises at least 95% homology to SEQ ID NO: 1.

21. The genetically modified seed of Claim 17, wherein the exogenous nucleic acid sequence is linked to a promoter selected from the group consisting of: a constitutive promoter and an inducible promoter.

22. The genetically modified seed of Claim 17, wherein said amino acid has the amino acid sequence of SEQ ID NO: 1.

23. The genetically modified seed of Claim 17, wherein said exogenous nucleic acid sequence has the sequence of SEQ ID NO: 3.

24. A substantially purified DAS5 polypeptide having cytochrome P450 activity and functioning in the brassinolide biosynthetic pathway.

25. The DAS5 polypeptide of Claim 24, comprising the amino acid sequence of SEQ ID NO: 1.

26. An antibody which binds to an isolated DAS5 polypeptide or antigenic fragments thereof.

27. An isolated *DAS5* polynucleotide encoding the amino acid sequence of SEQ ID NO: 1.

28. The *DAS5* polynucleotide of Claim 27, wherein the polynucleotide has the sequence of SEQ ID NO: 3.

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